

trachytes" have not yet been found in these islands, but that the predominant felspathic constituent of the more acid rocks is always plagioclastic. Hence they are described under the names of Andesite, Trachy-dolerite, and Trachy-diorite. The first of these would appear, from the definition given, to correspond with the well-known lavas of Hungary, the last to resemble the green-stone trachytes or "propylites" of the same country. These trachytic rocks are found to assume at times a vitreous character, thus passing into obsidian; and they occasionally exhibit the perlite modification of structure. The basaltic rocks, noticed by the author, do not appear to offer any features of special interest.

*La Biologie.* By Dr. Charles Letourneau. Bibliothèque des Sciences Contemporaines. (Paris: C. Reinwald et Cie., 1876.)

THIS small work within five hundred and fifty pages gives a concise description, in a popular form, of the phenomena exhibited by living organisms. "C'est une œuvre de vulgarisation," intended for the commencing student and the amateur. Such being the case many important facts have to be omitted, and much has to be embodied in a general form. As in most works many of the broad statements are apt to mislead. It is all very well to say, as does Dr. Letourneau, that the heart is trilocular in the reptiles and quadrilocular in birds, but considering the nature of that organ in the crocodiles, we think its nature in them ought to be mentioned. The title of the work is so all-embracing that we think it can hardly be justified by its contents. Morphology as well as physiology, together with the principles of evolution and classification, are all parts of "biology," nevertheless in the work before us morphology, and the immediate dependents of that science, are not touched upon. A more fitting title would have been "Comparative Physiology, Vegetable, and Animal." Several illustrations are introduced, and these are well selected, most if not all from other works. The descriptions are clear and concise, many too short to be of much service except as a first-book.

*Algebra for Beginners.* By James Loudon, M.A., Professor of Mathematics and Natural Philosophy, University College, Toronto. (Toronto, 1876.)

THIS work is an elementary one, taking the usual subjects up to and including Quadratic Equations. There is a chapter on Exponential Notation, giving a fair exposition of the Theory of Indices. There is nothing noteworthy in the execution: it is quite on a par with many similar text-books in this country, so that the chief point of interest is the information it gives us as to what instruction is given in the subject to the rising generation in Canada. The use of *monomial* strikes us as being affected. The work is exceedingly correctly printed. There are but six mistakes, we think, in the whole book, three of which are in the answers (xv. 3, xxxvii. 14, li. 16). Many of the questions are traceable to English sources.

## LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

### Coloured Solar Halos

IN his interesting scientific notes taken in the Himalayas, and printed in the last number of *NATURE* (p. 393), Dr. Arthur Schuster mentions the frequency of the occurrence, in India, of rainbow-coloured rings round the sun, and states that he has only once seen this phenomenon in England. The apparition of a complete iridescent circle is no doubt rarely seen, but I have, since the winter of 1873-74, when I first observed them, so frequently seen fragments of such rings both in Switzerland and in

England, that their non-occurrence, when thin white clouds are near the sun, seems to me to be the exception rather than the rule. In this country, and generally at low elevations, they are not easily detected by the unassisted eye, but in the high Alps both in summer and winter I have rarely failed to see them, when the sun and a thin white cloud were at the necessary distance from each other; they are, however, much more easily observed when the eye is protected from the glare by the neutral tinted glass which is frequently used for snow spectacles. The first and most vivid iridescent halo I ever saw, appeared projecting from the side of a mountain from behind which the sun was about to rise, near the summit of the Flüela pass, and about 7,000 feet above the sea. This was in the winter of 1873-74, and the thermometer stood at 19° Fahr. Last August and the first half of September I saw them almost daily on the Riffelberg and at Pontresina, and I have repeatedly noticed fragments of iridescent rings during the past autumn and winter in crossing Kensington Gardens about 9.30 A.M. In London, however, the blue and green rays are rarely visible, owing no doubt to their absorption by the murky atmosphere, whilst the orange and red rays easily reach the eye. On Sunday last, with snow upon the ground, I saw, through neutral tinted glass, the orange and red of the halo as the thin edges of clouds approached, or receded from the sun, and on Monday I distinctly saw the green also.

I hold these coloured halos to be a decisive proof of the frozen condition of the clouds in which they appear; firstly, because the cloud seen on the Flüela pass, when the thermometer was 13° below the freezing point, must have been frozen; and secondly, because I have repeatedly seen a portion, at least, of the lower half of the iridescent circle in the high valleys of Switzerland by looking along a field of snow sloping upwards towards the sun, and when the thermometer indicated temperatures varying from -15.5 Fahr. to +23° Fahr.

It would be worth while to have the occurrence or non-occurrence of these halos daily recorded in our meteorological observatories, as indications of the temperature of the air at great altitudes.

E. FRANKLAND

### On the Evidences of Ancient Glaciers in Central France

IN *NATURE*, vol. xiii. p. 31, Dr. J. D. Hooker gives some notes of traces of ancient glaciers in Central France, especially in the Mont Dore, and in a following short letter (p. 149 of the same volume), in reference to this notice of Dr. Hooker, the late Mr. G. Poulett Scrope, the celebrated describer of the volcanic regions of that country, calls in question the exactness of Dr. Hooker's observations. Dr. Hooker in a subsequent letter (p. 166) insists upon the correctness of his views, which he seems to believe original and never before advanced. Neither Dr. Hooker nor Mr. Poulett Scrope seem to have known that I have already, in a paper published in the *Ausland* (1872, Nos. 20 and 21, pp. 460 and 512) entitled, "Erosions und Gletscherwirkungen im Mont Dore, &c." described the traces of glaciers to a still greater extent than even Dr. Hooker does. Not only did I name the place in question (which is situated just at the entry of the Gorge d'Enfer, upper valley of Mont Dore) and describe it as an ancient frontal moraine of a glacier, but I have also given the view of the late Prof. Lecoq (who was never an Abbé as Mr. Poulett Scrope seemed to believe), who says in reference to this locality, *that if ever a glacier had existed in Mont Dore it must have been in this valley*. But besides this point, which in itself is decisive, I noticed a great number of other localities affording examples of polished rocks, transported and rounded blocks, stone lines, and other evident traces of glaciers, which I will not re-enumerate, as they may be found in my above-mentioned paper.

It is quite clear that Mr. Poulett Scrope was in the wrong in denying that those signs in the Mont Dore are the effects of glacial action, but on the other hand, I must, in justice to myself, courteously remind Dr. Hooker that I have the priority in describing those marks as glacial traces which Lecoq interpreted as water-flood traces. I may say in conclusion that this learned geologist of Central France (Lecoq) personally turned my attention to those phenomena while visiting the Auvergne in 1867, and seemed inclined to accept my interpretation.

Breslau University, Prussia, March 10 A. VON LASAULX

### The Uintatherium

IN the abstract of my lecture published in *NATURE*, vol. xiii., p. 387, it is stated that "the first discovered evidences of the

existence of animals of this group were described by Leidy, in 1872, under the name of *Uintatherium*."

Intricate questions of priority, such as those in which the nomenclature of many of the recent American palæontological discoveries is unfortunately involved, cannot be discussed and settled in brief abstracts; but I see that the above statement conveys a wrong impression, which I shall be glad to correct. Bones of some of these animals were discovered by Prof. Marsh and Lieut. Wann, of the Yale College exploring party, near Sage Creek, Western Wyoming, in September 1870, and described by the former in the following year (*American Journal of Science and Arts*, July 1871, p. 351), though referred provisionally to the genus *Titanotherium*. There seems, however, to be no doubt that Leidy's name, *Uintatherium* (*Proceedings of the Academy of Natural Sciences*, Philadelphia, 1872, p. 169; read July 30, published August 1), was the earliest of the new generic designations applied to any of the group, and therefore ought to be adopted for the whole, until it is clearly shown that any sufficiently important distinctions exist between them to warrant their separation into different genera.

March 18

W. H. FLOWER

### Morell's "Euclid Simplified"

IT is only quite recently that my attention has been directed to the review of "Euclid Simplified" in *NATURE*, vol. xiii. pp. 201-204. I shall endeavour to condense my reply to the criticisms contained in that review as much as possible, taking them in the order in which they occur, which will simplify the controversy.

And firstly, it is objected that "the title 'Euclid Simplified' is a misnomer, for the method of Euclid (the geometer) is departed from altogether." I reply by explaining that by far the greater part of the theorems and problems, and also the method followed throughout in "Euclid Simplified" are taken directly from Amiot's "*Éléments de Géométrie*" (15th edition, 1873). In his preface to another work, "*Léçons Nouvelles de Géométrie Élémentaire*" (1865), Amiot says: "Les éléments de géométrie que nous venons de réimprimer et cette seconde édition des *Léçons nouvelles de géométrie*, sont deux ouvrages différents. Le premier n'est que l'exposé de la géométrie des anciens; le second est un essai de géométrie générale, c'est-à-dire qu'il comprend non seulement les éléments d'Euclide, mais encore les principes de la géométrie moderne, qui est resumée et, pour ainsi dire, personnifiée dans les travaux de M. Chasles, notre géomètre par excellence." I infer that in adopting and following Amiot's "Elements," I have followed the ancients and Euclid, though shortened and simplified.

At a subsequent part of the review the writer is exposed to severe animadversions for his intention to produce what is represented to be an epitome of the brilliant discoveries of M. Chasles. This matter can also be set at rest by referring to the extract from the preface of M. Amiot, previously given. Mr. Morell has only projected a compilation and translation from Amiot's "*Léçons Nouvelles*," and from Rouché and De Comberousse (*1<sup>re</sup> Partie. Géométrie Plane. Appendice*), also treating of modern geometry.

Passing from the title to the contents, I admit that the typographical errors are unfortunately numerous, nor is it possible to avoid this except by employing the best and most expensive printers. The misprints *maner* and *cord*, the omission of the word "side" before "of the equilateral triangle," and the passage relating to the quadrilateral *ABCD* must be referred to this category. The latter passage is translated from Legendre (edition 1868 [not 1872], p. 78), and requires the fourth side *AD* to be added, which has been omitted by the printer. For "without changing" read also "thereby changing"—in this case I confess an oversight of the writer.

I proceed next to meet the strictures of the reviewer relating to Gallicisms and the use of terms new to boys. In defence I might point to the Hellenisms and Latinisms in our School Euclid, and affirm that Gallicisms are more nearly akin to modern English.

I content myself with pointing to the employment of terms, condemned in "Euclid Simplified," by writers of approved excellence, including Gerard's "Elements of Geometry." It is objected that I write, p. 168, "The centre of similitude is the meeting-place." I find at p. 36 of Mr. Gerard's "Elements of Geometry," "The meeting point of two lines." . . . Again the terms "perpendicular to the centre, perpendicular to the middle," censured in "Euclid Simplified," ought to be taken in connection with the ensuing words: "to the centre of the straight line *AA'*" and "to the middle of *AB*." Thus ampli-

fied, the terms agree with those used by Mr. Wormell—"perpendicular to *DE* at its middle point *C*." "The perpendiculars to the sides of a triangle at their middle points." ("Modern Geometry," pp. 78-81.)

Before I dismiss this question of terminology, I wish to suggest that recent works on geometry in high repute, especially those I have just named, introduce very fully terms with which boys are not at all acquainted, and which are new in English. I briefly enumerate a list of these new importations: Escribed, exscribed, explements, intercepts (used as a noun), circumscriptible, intangence, bisectrix, extangent, median, a plane lune, octant, and many more which cannot be introduced here for want of space.

Considering the further criticisms, I beg to explain that no notice of the Association for the Improvement of Geometrical Teaching was inserted in the preface because absence from England and ill-health had severed me from all knowledge of its proceedings and of its Syllabus.

If the enunciations are loosely and inelegantly worded, Amiot must bear the blame which attaches in a greater degree to our translations of Euclid.

Further, the objection made to my use of the terms "capable angle" must extend to the use of the same term in Gerard's "Elements," p. 310.

In the definition of the parallelogram the printer has omitted "and parallel," words which I find in my MS. The term *lozenge* is used as synonymous with rhombus by Wormell ("Elementary Course of Geometry," p. 65), and Gerard, p. 235. The definition of the circumference is that of Amiot ("Elements," p. 40) and Gerard (p. 76). That described by the reviewer as the common school-boy definition is Wormell's, p. 28. The expression "a circumference is generally described in language by one of its radii" is thus given in Amiot: "On désigne ordinairement une circonférence par l'un de ses rayons." I shall pass over the criticisms about "the" and "a" as too minute, also the remark about major and minor arcs met by Def. 36. Problem VII. shows any boy of ordinary intelligence how to bisect a line.

Derivation in notes is not treated syntactically, and can also be dismissed. But the remarks of the critic about the use of *R* as meaning right angle are met by referring to Wormell's (p. 173) use of *GCM* as greatest common measure. The term pentadecagon is used by Gerard (p. 202).

The proof of the ratio of two rectangles  $\frac{R}{R'}$  is Legendre's; and

at p. 67, after showing that  $\frac{R}{r} = 4$ , he adds: "Ainsi le rectangle *R* contient quatre fois le rectangle pris pour unité" (i.e., *r*). This conclusion in my book is criticised.

The reasoning to Theorem VI. (p. 148), which is called defective in the review, only errs by excess of proof. I have little more to add. The "Essentials of Geometry" are almost entirely a translation of a useful Spanish work by noted mathematicians.<sup>1</sup> The 205 exercises are throughout from Amiot, and as these 205 exercises are literally all from Amiot, it is a serious charge to say, like the reviewer, that many of them are objectionable in geometry. In Exercise 30 "a" quadrilateral is a misprint: read "this."<sup>2</sup>

J. R. MORELL

### "Weight" and "Mass"

THE correspondence which has recently appeared in *NATURE* on this subject has great interest for those engaged in teaching Physics. I confess I regretted to learn that "gravity" had been diverted from its long recognised meaning in science—that pointed out by Mr. Stoney—at Glasgow, to be employed for one of the meanings of the word "weight." The symbol "*g*" is "gravity" represented by its initial letter, so that if the meaning of the word be changed, consistency would require that the symbol should be altered. I find, practically, no difficulty in restricting the word "weight" to the sense of force, insisting on the use of the phrases "mass of so many pounds, ounces, or grammes," and "force equal to the weight of a mass of so many pounds, grammes," &c.; for which, after some time, I allow the use of the phrase, "the weight of so many pounds."

On another point of nomenclature I would suggest that those who, like myself, think it necessary to use the British units co-ordinately with the metric, should adopt some analogue to the

<sup>1</sup> Their names will be given when I recover the book or get another copy.

<sup>2</sup> The work of Mr. Wormell to which reference is made in this letter is (with one exception) his excellent "Modern Geometry," published by Murby.